



United States General Accounting Office
Washington, DC 20548

National Security and
International Affairs Division

B-285810

August 25, 2000

The Honorable Jerry Lewis
Chairman, Subcommittee on Defense
Committee on Appropriations
U. S. House of Representatives

Subject: Defense Acquisitions: Status of Strategic C4 System Modernization and Plans
To Integrate Additional Mission Capabilities

Dear Mr. Chairman:

Your letter of October 18, 1999, referred to the Department of Defense's (DOD) plans to modernize its current strategic command, control, communications, and computer (C4) capabilities for ballistic missile warning, space control, and air sovereignty/defense missions. Your letter mentioned that command and control functions for national missile defense may be centralized with these missions and that the U.S. Space Command has been assigned new missions called computer network defense/attack.¹ You expressed concern about how DOD plans to integrate the systems needed for new missions into the systems used for current missions. As agreed, this report provides information on DOD's plans to (1) modernize current strategic C4 capabilities and (2) integrate additional system capabilities for newly planned and assigned missions.

The U.S. Space Command and the North American Aerospace Defense Command (hereinafter referred to as the Commands) are supported by DOD's strategic C4 system capabilities associated with missile warning, space control, and air sovereignty/defense.² The Air Force acquired the current C4 systems during a 17-year effort called the Cheyenne Mountain Upgrade program that began in 1981. The systems, which cost about \$1.8 billion, were declared operational in 1998. The Commands have now determined that some of the systems' components are not well integrated, are becoming unsupportable because spare parts are no longer available, and would be unresponsive to future mission needs. As a

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¹ Computer network defense includes activities to protect and defend information in computers and computer networks, and computers and networks themselves, from disruption, denial, degradation, or destruction. Computer network attack is the ability to deny, disrupt, or degrade enemy computers and networks.

² The U.S. Space Command is a DOD unified combatant command that is responsible for conducting space operations, including providing missile warning and space surveillance support to the North American Aerospace Defense Command. The North American Aerospace Defense Command is a binational U.S. and Canadian command responsible for warning of an attack against North America, including surveillance and control of North American airspace.

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GAO/NSIAD-00-212R DOD Strategic C4 Systems

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result, the Commands initiated a long-term program that is intended to exploit off-the-shelf technology to achieve modernized capabilities that are less costly to operate. The modernized capabilities to be developed are referred to as the North American Aerospace Defense Command/U.S. Space Command Warfighting Support System (hereinafter referred to as the warfighting support system).

Also, in anticipation of implementing additional missions, the Commands are studying other system capabilities that may be needed. For example, assuming that the United States deploys a national missile defense system, the necessary command and control functions could become the Commands' responsibility.³ Also, the U.S. Space Command assumed the responsibility for DOD's computer network defense mission on October 1, 1999, and it is to assume the responsibility for the computer network attack mission on October 1, 2000.

RESULTS IN BRIEF

The U.S. Space Command's and the North American Aerospace Defense Command's plan to modernize their strategic command, control, communications, and computer systems is being implemented by the Air Force, which is overseeing the efforts of two competing contractors to develop detailed plans for designing and implementing the modernization program. In September 2000, the Air Force expects to select one of the contractors to incrementally execute the program, which could last 15 years. Until a single contractor is selected, final modernization plans and estimated total acquisition and implementation costs will not be available.

The Commands have not completed plans for integrating new mission areas into their command, control, communications, and computer systems. The Commands, in conjunction with other DOD organizations, are studying, developing, and testing concepts for a national missile defense system. The command, control, communications, and computer capabilities for such a system could be incorporated into DOD's ballistic missile warning infrastructure located at Cheyenne Mountain and eventually the modernization program. However, until the President decides that a national missile defense system should be deployed and assigns the mission to a specific military command for execution, plans to integrate the necessary command, control, communications, and computer capabilities into the Commands' systems will remain preliminary. In addition, the Secretary of Defense assigned responsibility to the U.S. Space Command for implementing DOD's computer network defense/attack missions. The Command's plans for implementing the computer network attack mission beginning October 1, 2000, have been finalized and are awaiting Secretary of Defense approval; plans for integrating these missions with current missions have not been completed.

³ National missile defense is to protect the United States from limited ballistic missile attacks from certain nations that possess such a capability.

**MODERNIZATION PLANS FOR
CURRENT C4 SYSTEMS HAVE
NOT BEEN COMPLETED**

The Commands' plans for modernizing their current strategic command and control mission capabilities by acquiring the warfighting support system include (1) seeking solutions to the identified deficiencies associated with supportability and future responsiveness and (2) moving from the separate C4 systems that support the Commands' current missions to an integrated system that will reduce operating costs. These objectives were established for several reasons. First, some of the mainframe computer systems that were purchased in the 1980s are no longer produced, and the supplier has stated in writing that technical assistance and spare parts would not be provided after fiscal year 2000. Second, the Commands have estimated that their current C4 systems are not likely to be capable of processing and disseminating the increased amounts of data that will be generated by new sensors being developed. An example is the Space-Based Infrared System that is to support theater and national missile defense missions. Third, the current C4 system architecture is an aggregation of individual mission-oriented, but overlapping, systems that are not interoperable. According to Command officials, this situation often requires considerable time to implement changes in response to new mission needs. The Commands' objectives for the modernization effort involve making incremental system replacements by applying new technologies that comply with standards mandated by the Under Secretary of Defense for Acquisition, Technology, and Logistics to ensure interoperability—the electronic exchange of data—among DOD's C4 systems.

The Commands' plans are being implemented by the Air Force whose acquisition strategy consists of two phases—migration demonstration and execution. Contracting activities for the migration demonstration phase started in November 1999, with the issuance of a request for proposals. In February 2000, two contractors were each awarded a \$2.5-million contract for a 4-month migration demonstration phase. The contracts require each contractor to produce a master plan that includes (1) a system architecture and a schedule for how the architecture is to be implemented, (2) an acquisition strategy containing a technology forecast and risk assessment, (3) a program management and systems engineering plan, and (4) a model for reducing total life-cycle costs. Each master plan is to reflect the contractor's interpretation of the Commands' requirements and concepts of operations and address operational priorities for warfighting support system development and implementation. The master plans describing the contractors' proposed system architecture were submitted in July 2000 as competing proposals for the execution phase.

The execution phase is to begin in September 2000 following a source selection process that started in July with the receipt of the contractors' proposals. The Air Force will select one contractor who will have total system performance responsibility for maintaining and sustaining the current strategic C4 capabilities, developing and implementing new capabilities in increments, and ensuring mission integrity throughout the period of system improvement. According to Command officials, the modernization effort could last 15 years. Until the Air Force selects a single contractor, final plans for modernizing the Commands' strategic C4 capabilities will not be available.

**PLANS TO INTEGRATE ADDITIONAL
SYSTEM CAPABILITIES FOR NEW MISSIONS
HAVE NOT BEEN COMPLETED**

The Commands are developing plans to integrate system capabilities for the planned missile defense mission and have recently proposed plans to implement the computer network defense and attack missions. Plans for command and control functions for the national missile defense system are preliminary, awaiting a decision from the Secretary of Defense and the President on whether to deploy the system. The U.S. Space Command has developed a plan to implement computer network defense and attack separately from other space missions and will consider integrating them at a later time. The Command will not assume responsibility for the computer network attack mission until October 2000, and it has proposed an organization structure for implementing the mission.

**C4 Capabilities For National
Missile Defense Are Being Studied**

This summer, the Secretary of Defense is expected to recommend a course of action to the President regarding the feasibility of deploying a national missile defense system.⁴ The Commander in Chief of the Commands has stated that a national missile defense mission would fit closely with the North American Aerospace Defense Command's missile warning mission and it (1) would share the Commands' space-based and ground-based missile warning sensors and (2) could employ the command and control infrastructure of the Cheyenne Mountain Operations Center.⁵ Currently, however, the latest unified command plan, which the President approved on September 29, 1999, does not assign the national missile defense mission to a specific military command.⁶

Meanwhile, various DOD organizations, including the Commands, the Army Strategic and Missile Defense Command, the Ballistic Missile Defense Organization, and the Air Force Space Command, have been drafting requirements, studying operations concepts, and developing technologies and systems to carry out a national missile defense mission. In addition, the Air Force Space Command and the Air Force's Strategic and Nuclear Deterrence Command and Control System Program Office⁷ are monitoring ongoing missile defense technology and system development to ensure that these activities do not lead to

⁴ See *Missile Defense: Status of the National Missile Defense Program* (GAO/NSIAD-00-131, May 31, 2000) for information on this planned system.

⁵ Statement of General Ralph E. Eberhart, U.S. Air Force, Commander in Chief, North American Aerospace Defense Command and U.S. Space Command, before the Senate Committee on Armed Services, Strategic Subcommittee (Mar. 8, 2000).

⁶ A unified command plan provides basic guidance, missions, responsibilities, and force structure to all unified combatant commanders and designates geographical and functional responsibilities for specific combatant commanders.

⁷ This Air Force program office reports to the Air Force Electronic Systems Center--a component of the Air Force Material Command—and is responsible for maintaining and sustaining the U.S. Space Command's existing C4 systems and acquiring the new warfighting support system.

designs that would be incompatible with the future warfighting support system. This action includes coordinating the development of warfighting support system architecture documents with national missile defense command and control concepts. However, until the President decides that a national missile defense system should be deployed and assigns the mission to a specific military command for execution, these activities are preliminary.

**Computer Network Defense And
Attack Mission Implementation Plans
Have Been Finalized**

In December 1998, as a result of an increasing number of probes and intrusions of defense computer systems and networks, the Secretary of Defense established the Joint Task Force for Computer Network Defense to coordinate and direct the defense of such systems and networks as an interim step to assigning a computer network defense mission to a unified command. In January 1999, the Secretary assigned the responsibility for this mission to the U.S. Space Command, which was effective on October 1, 1999. This Command has assumed the Joint Task Force's role of coordinating and directing operations to protect and defend DOD's computer systems and networks against attacks or intrusions. The Joint Task Force now reports to the U.S. Space Command and will remain the primary operations center to monitor and respond to such attacks. The Joint Task Force is supported by computer emergency response teams in each of the military services that monitor and respond to potential computer incidents within their respective organizations. The U.S. Space Command has developed an implementation plan that outlines its computer network defense role, responsibilities, and strategy. This plan states that the mission will initially be performed separately from space missions, but it later will be considered for integration with space missions as part of the warfighting support system implementation.

Also in January 1999, the Secretary assigned the responsibility for the computer network attack mission to the U.S. Space Command, which is to be effective on October 1, 2000. The U.S. Space Command indicated a desire to consolidate the computer network defense and attack missions and to incorporate the military services' emergency response teams into the military services' component commands of the U.S. Space Command—the Army Space Command, the Naval Space Command, and the 14th Air Force (a component of the Air Force Space Command). The Command and the military services collaborated in identifying and studying organizational alternatives for executing the mission. The Command has developed an implementation plan that proposes to assign military computer network attack forces to the military services' components of one or more unified commands. Under this proposal, Army forces would be assigned to the Army Space Command, Air Force forces would be assigned to the Air Combat Command (the Air Force component of the Joint Forces Command), and naval forces would be assigned to all unified commanders' naval components. Should a crisis occur, and as directed by the President or the Secretary of Defense, control of these computer network attack forces would be transferred to the unified command needing support. This plan has been submitted to the Secretary of Defense for approval in preparation for instituting this mission on October 1, 2000. At this time, it is not known whether this proposed structure will effectively and efficiently meet the computer network attack mission needs.

AGENCY COMMENTS

DOD provided written comments on a draft of this report, which we reprinted in enclosure 1. DOD concurred with the report and suggested technical changes for clarification and accuracy that we incorporated as appropriate.

SCOPE AND METHODOLOGY

To review the plans for modernizing strategic C4 capabilities, we examined the U.S. Space Command's March 1998 long-range plan; the Commands' April 1998 draft master evolution plan, May 1998 mission need statement, February 1999 capstone requirements document, and October 1999 operational architecture for the warfighting support system; and the Air Force's October 1999 statement of objectives and November 1999 request for proposals for phase one of the contract to acquire the warfighting support system. To gain additional understanding of the modernization plans, we discussed information contained in these documents, the rationale for modernizing the C4 capabilities, and the preliminary plans for implementing the modernization program with representatives from Air Force Headquarters in Washington, D.C. and U.S. and Air Force Space Commands and the Air Force's Strategic and Nuclear Deterrence Command and Control System Program Office at Peterson Air Force Base, Colorado Springs, Colorado.

To review the plans for integrating additional system capabilities for newly planned and assigned missions, we examined the Joint Chiefs of Staff 1999 unified command plan; the Secretary of Defense's direction and the charter for creating the Joint Task Force for Computer Network Defense; the U.S. Space Command's computer network defense/attack implementation plans and concept of operations; and the planning, requirements, and architecture documents discussed above. To gain additional understanding of the planning to implement and integrate these missions into the Commands' mission structure, we discussed planning and architecture information and ongoing planning efforts with representatives of (1) the Office of the Assistant Secretary of Defense for Command, Control, Communications and Intelligence and the Joint Staff in Washington, D.C.; (2) the Defense Information Systems Agency, and the Joint Task Force for Computer Network Defense in Arlington, Virginia; and (3) the U.S. and Air Force Space Commands and the Air Force's Strategic and Nuclear Defense Command and Control System Program Office at Peterson Air Force Base, Colorado Springs, Colorado.

We performed our review from December 1999 through July 2000 in accordance with generally accepted government auditing standards.

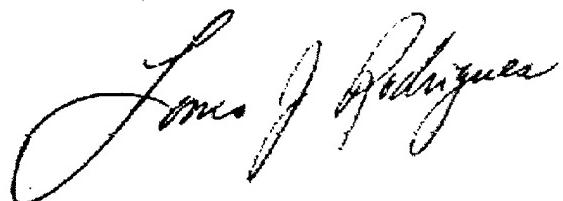
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We are sending copies of this report to Senator Daniel K. Inouye, Senator Carl Levin, Senator Ted Stevens, Senator John Warner, Representative John P. Murtha, Representative Ike Skelton, and Representative Floyd D. Spence in their capacities as Chairs or Ranking Minority Members of Senate and House Committees and Subcommittees. We are also sending copies to the Honorable William S. Cohen, Secretary of Defense; the Honorable F. Whitten Peters, Secretary of the Air Force; and the Honorable Jacob Lew, Director, Office of Management and Budget. Copies will also be made available to others upon request.

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If you or your staff have any questions concerning this report, please contact me on (202) 512-4841. Major contributors to this report were Homer Thomson, Frederick G. Day, and Maria A. Durant.

Sincerely yours,

A handwritten signature in black ink, appearing to read "Louis J. Rodrigues". The signature is fluid and cursive, with a large, stylized 'L' at the beginning.

Louis J. Rodrigues
Director, Defense Acquisitions Issues



**ASSISTANT SECRETARY OF DEFENSE
6000 DEFENSE PENTAGON
WASHINGTON, DC 20301-6000**



August 23, 2000

COMMAND CONTROL,
COMMUNICATIONS AND
INTELLIGENCE

Mr. Louis J. Rodrigues
Director, Defense Acquisitions Issues
National Security and International
Affairs Division
U.S. General Accounting Office
Washington, D.C. 20548

Dear Mr. Rodrigues:

This is the Department of Defense (DoD) response to the General Accounting Office (GAO) draft report, "DEFENSE ACQUISITIONS: Status of Strategic C4 System Modernization and Plans to Integrate Additional Mission Capabilities," dated July 20, 2000 (AO Code 707464/OSD Case 2051).

The DoD concurs with the draft report. Suggested technical changes for clarification and accuracy have been provided separately.

The Department appreciates the opportunity to comment on the draft report.

Sincerely,

Arthur L. Money

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